

In the claims:

1. (Amended) A method of assembling and operating a physical system from a remote location, such physical system having a plurality of structural elements and structural interconnections, such method comprising the steps of:

~~creating a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled;~~

~~— converting the graphical representation into an element list delineating the elements and the interconnections;~~

providing a means for electrically interconnecting the plurality of structural elements;

providing an element controller for configuring the elements and controlling the means for electrically interconnecting;

creating an element list delineating the elements, the interconnections and configurable properties of the physical system to be assembled and operated from the remote location;

transferring the element list from the remote location to ~~an~~ the element controller of the interconnection means;
and

assembling and operating the system by the element controller in accordance with the element list by interconnecting and configuring the elements.

2. (Amended) The method of assembling and operating a physical structure of a system as in claim 1 ~~wherein the step of creating the graphical representation further~~

comprising creating a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled and providing a graphical user interface with an assembly area for display of the graphical representation and a reference area for display of icons of structural elements, forcing functions and measurement instruments.

3. (Original) The method of assembling and operating a physical structure of a system as in claim 2 further comprising dragging icons of elements from the reference area to the graphical representation in the assembly area.

4. (Original) The method of assembling and operating a physical structure of a system as in claim 3 further comprising connecting the icons of the elements in the assembly area.

5. (Original) The method of assembling and operating a physical structure of a system as in claim 2 further comprising spawning a job object within the element controller in response to receipt of the element list.

6. (Original) The method of assembling and operating a physical structure of a system as in claim 5 further comprising decomposing the job object into a set of job elements.

7. (Original) The method of assembling and operating a physical structure of a system as in claim 6 wherein the step of decomposing the job object into a set of job

elements further comprises validating the parameters against a set of instrument and element limitations.

8. (Original) The method of assembling and operating a physical structure of a system as in claim 7 wherein the step of assembling the system further comprising closing a set of contacts within a matrix switch.

9. (Original) The method of assembling and operating a physical structure of a system as in claim 8 wherein the step of operating the system further comprising connecting a forcing function to the assembled elements.

10. (Original) The method of assembling and operating a physical structure of a system as in claim 9 further comprising recording a system response to the forcing function.

11. (Original) The method of assembling and operating a physical structure of a system as in claim 10 further comprising transferring a graphical representation of the system response to the remote location.

12. (Original) The method of assembling and operating a physical structure of a system as in claim 1 further comprising defining the element list as a netlist.

13. (Amended) Apparatus for assembling and operating a physical system from a remote location, such system having a plurality of structural elements and structural interconnections ~~from a remote location~~, the apparatus ~~method~~ comprising:

~~means for creating a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled;~~

means for electrically interconnecting the elements;

an element controller for configuring the elements and controlling the means for electrically interconnecting;

~~means for converting the graphical representation into~~
creating an element list delineating the elements and, the interconnections and configurable properties of the physical system to be assembled and operated from the remote location;

means for transferring the element list from the remote location to an the element controller of the interconnection means; and

means for assembling and operating the system by the element controller in accordance with the element list by interconnecting and configuring the elements.

14. (Amended) The apparatus for assembling and operating a physical structure of a system as in claim 13 wherein the means for creating the element list further comprises a means for creating a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled and further comprises means for providing a graphical user interface with an assembly area for display of the graphical representation and a reference area for display of icons of structural elements, forcing functions and measurement instruments.

15. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 14 further

comprising means for dragging icons of system elements to the graphical representation in the assembly area.

16. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 15 further comprising means for connecting the icons of the elements in the assembly area.

17. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 13 further comprising means for spawning a job object within the element controller in response to receipt of the element list.

18. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 17 further comprising means for decomposing the job object into a set of job elements.

19. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 18 wherein the means for decomposing the job object into a set of job elements further comprises means for validating the measurement elements against a set of instrument and structural element limitations.

20. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 19 wherein the means for assembling the system further comprises means for closing a set of contacts within a matrix switch.

21. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 20 wherein the means for operating the system further comprises means for connecting a forcing function to the assembled elements.

22. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 21 further comprising means for recording a system response to the forcing function.

23. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 22 further comprising means for transferring a graphical representation of the system response to the remote location.

24. (Amended) Apparatus for assembling and operating a physical system from a remote location, such system having a plurality of structural elements and structural interconnections ~~from a remote location~~, the apparatus method comprising:

~~a remote terminal adapted to create a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled;~~

a plurality of switches for electrically interconnecting the elements;

an element controller for configuring the elements and controlling the plurality of switches;

a conversion processor adapted to ~~convert the graphical representation into~~ create an element list delineating the elements and the interconnections and

configurable properties of the physical system to be assembled and operated from the remote location;

a communication processor adapted to transfer the element list from the remote location to an element controller of the plurality of switches; and

wherein the element controller is adapted to assemble and operate the system by the element controller in accordance with the element list by interconnecting and configuring the elements.

25. (Amended) The apparatus for assembling and operating a physical structure of a system as in claim 24 wherein the remote location further comprises a remote terminal adapted to create a graphical representation of the physical system at the remote location showing the elements and connections of the system to be assembled and further comprises a graphical user interface adapted to provide an assembly area for display of the graphical representation and a reference area for display of icons of structural elements, forcing functions and measurement instruments.

26. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 25 further comprising a pointer adapted to drag icons of system elements to the graphical representation in the assembly area.

27. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 26 further comprising a connector routine adapted to connect the icons of the elements within the assembly area.

26. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 24 further comprising a job object adapted to decompose the element list into a set of job elements.

27. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 26 further comprising a validation object adapted to validate the job elements.

28. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 27 further comprising a an object queue adapted for scheduling and operating the physical system described by the job elements.

29. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 28 further comprising a forcing function adapted to load the physical system.

30. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 29 further comprising a measurement instrument adapted to record a system response to the forcing function.

31. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 28 further comprising a matrix switch adapted to interconnect the structural elements, the forcing function and the measurement instrument of the physical system.

32. (Original) The apparatus for assembling and operating a physical structure of a system as in claim 31 further comprising a job object adapted to transfer a graphical representation of the system response to the remote location.
